

The Role of Learning Strategies in Second Language Acquisition: A Selected Literature Review

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20. Abstract (Continued)

serving as the foundation for a research model on the role of learning strategies in second language acquisition.

Keywords: English as a second language.

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FOREWORD

The Instructional Technology Systems Technical Area of the Army Research Institute (ARI) has conducted research in the area of second language acquisition for several years. This research serves the Army's special interest in discovering the best methods for improving fluency in English among the many soldiers whose first language is not English. This report is the first in a series of three describing a project to discover the strategies that successful learners naturally employ in acquiring a second language. The ultimate goal of the project is a more effective training program that incorporates instruction in the application of those successful strategies.

This project was conducted as part of Program Task 3.1.1, Improving Job Skills Education for Soldiers, and under the authority of the Letter of Agreement entitled "Coordination of Efforts on the Job Skills Education Program (JSEP), Evaluation of the Army's Basic Skills Education Program (BSEP), and the Job Skills Education Program Academic Competencies Testing (JSEPACT)" (effective date, 20 April 1984). On 3 April 1987, Robert Ayers, Educational Program Administrator in the Army's Education Division, was briefed by Dr. Mark Sabol, ARI Research Psychologist, on the research methodology, results, and possible applications. The proposed applications of this project are within the Army's ongoing training programs in English as a second language. By identifying the learning strategies that successful students of English employ spontaneously, the project increases the effectiveness of such training programs through the addition, where deemed appropriate, of explicit training in the application of those strategies.



EDGAR M. JOHNSON
Technical Director

THE ROLE OF LEARNING STRATEGIES IN SECOND LANGUAGE ACQUISITION:
A SELECTED LITERATURE REVIEW

EXECUTIVE SUMMARY

Requirement:

To facilitate gains in fluency in English among recruits for whom English is a second language.

Procedure:

To prepare for the design of a study that reveals the differences in approaches employed by successful versus unsuccessful learners of English as a second language, a review of the current literature was conducted. The outcome is a description of recent theoretical developments in those areas of cognitive psychology that relate to second language acquisition.

Findings:

It was discovered that no current theory provides an adequate description of the use of strategies among learners of language skills. However, Anderson's general cognitive theory was found to provide a framework within which the acquisition of language skills can be described.

Utilization of Findings:

Anderson's general cognitive theory is suggested as a foundation on which a research model on the role of learning strategies in the acquisition of a second language can be developed. The development of such a model is described in the second report of this series. The ultimate utilization of this work is the development of an improved training program that would begin with instruction in the use of successful learning strategies.

THE ROLE OF LEARNING STRATEGIES IN SECOND LANGUAGE ACQUISITION:
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THE ROLE OF LEARNING STRATEGIES IN SECOND LANGUAGE ACQUISITION: A SELECTED LITERATURE REVIEW

The purpose of this paper is to review literature in the area of cognitive skill acquisition, learning strategies, and second language acquisition. The review will be divided into three sections. In the first section, current theory about the acquisition of complex cognitive skills will be described. The focus of this section will be on Anderson's three-stage model of skill acquisition and his "ACT" theory of cognitive processing (Anderson, 1981, 1983). In the second section, traditional models of second language acquisition will be described. Included in this section will be a discussion of receptive skill acquisition in second language learning with a focus on listening comprehension as a component of second language acquisition. In the third section, learning strategy models which are relevant to second language acquisition will be discussed.

BACKGROUND

The identification and application of learning strategies by learners of a second language has gained much importance and attention in the conduct of research on second language learning. Learning strategies are defined as special steps or techniques applied by the learner to facilitate the acquisition, storage, retrieval, or use of information (Dansereau, in press; Rigney, 1978). In language acquisition, learning strategies pertain to "activities in which the learner may engage for the purpose of improving target language competence" (Bialystok, 1983, p. 101).

Prior research completed by InterAmerica Research Associates has focused on describing general learning strategies used by students of English as a second language (O'Malley, Chamot, Stewner-Manzanares, Kupper & Russo, 1985a; O'Malley, Chamot, Stewner-Manzanares, Russo & Kupper, 1985b). An initial study of learning strategy uses identified three groups of learning strategies reported by ESL students via small group interviews:

- Metacognitive Strategies. Techniques that entail planning for, monitoring, or evaluating the success of a learning activity,
- Cognitive Strategies. Procedures that involve direct manipulation or reorganization of the information to be learned, and
- Social Mediation/Affective Strategies. Techniques used by the learner which require the presence of another person with whom the learner interacts, or which involve attitude toward learning.

The second study completed by the InterAmerica research team (O'Malley et al., 1985b) was undertaken to examine the influence of strategy training on receptive and productive skills in a second language. In this experimental study, ESL students were trained in the use of selected learning strategies with vocabulary, listening and speaking tasks in order to determine if the trained students performed better than the untrained control group. Analysis of the results indicated that oral proficiency in English increased

significantly during the period of training relative to the control group. Strategy training also produced significant improvements in listening skills, but the effectiveness of the training depended on the difficulty of the task and the strength of the cues for using the strategy. The effectiveness of the vocabulary strategy training varied depending on the ethnic background of the students. Asian students persisted successfully in using rote repetitive strategies, whereas Hispanic students adopted strategies presented during training and showed commensurate gains compared to controls.

These research efforts extended previous findings related to learning strategies in second language acquisition (Naiman, Frohlich, Stern, & Todesco, 1978; Rubin, 1975; and Wenden, 1983) by classifying learning strategies used by second language learners (O'Malley, Chamot, Stewner-Manzanares, Russo & Kupper, 1985a) and by documenting the use of learning strategies at different levels of task complexity (O'Malley, Chamot, Stewner-Manzanares, Russo & Kupper, 1985b). However, two important issues remain to be addressed. First, a clear understanding of the role of learning strategies in models of second language learning and acquisition remains unresolved. Second, critical aspects of learning strategy use related to language acquisition tasks, such as listening comprehension, require clarification. These critical aspects include: the kinds of strategies students use for listening comprehension, whether or not the strategies change over time, and the ways in which the students gained initial familiarity with the strategies.

In order to address these important and unresolved issues, an applied research project was planned and implemented by the InterAmerica research team. This current investigation has a two-fold focus. First, a research model is proposed identifying the role of learning strategies in second language learning and acquisition. Second, based on the research model, an applied research study of learning strategy applications to listening comprehension tasks among second language learners is being undertaken. This first report presents a literature review on the role of learning strategies in second language acquisition. A second report will contain the research model, and a third report will present the research study.

COGNITIVE SKILLS ACQUISITION

The approach we have taken in the review of literature in cognitive psychology is that second language acquisition is a cognitive skill. Thus, a comprehensive model of cognitive skill acquisition is appropriate and applicable as a theoretical framework in a second language learning situation. Viewing second language acquisition in this way has several advantages. First, considerable research in cognitive skill acquisition has occurred in recent years in such disciplines as cognitive psychology and computer science (e.g., Anderson, 1981). By applying relevant theories and models developed in these other disciplines to the study of second language acquisition, we are able to provide a comprehensive and well-specified theoretical framework that is consistent with related work.

A second advantage to viewing second language acquisition as a cognitive skill is that the level of specificity and the "dynamic" or "process" orientation of models of skill acquisition allow us to provide a more detailed process view of second language acquisition than is provided by most current

models of second language learning (see, for example, Chamot & Stewner-Manzanares, 1985). A third advantage is a pedagogical one and pertains to the development and use of learning strategies in second language learning. Anderson (1981, 1983) described cognitive skill acquisition as a "three-stage" process using a "production system" notation to specify the dynamics of the system during the skill acquisition process. This framework is particularly useful in the current context because it helps us to identify and test the existence and applicability of specific learning strategies that are appropriate at various stages in the skill acquisition process. Although it is recognized that biological/neurological factors and socio-affective factors also play a role in second language acquisition, the focus of the literature review is on a cognitive model; thus, these other factors will not be addressed.

There are a number of ways to represent the competence that underlies performance of a complex cognitive skill, including rational task analysis (Gagne & Paradise, 1961), interrelated procedural networks (Brown & Burton, 1978), and production systems (see, for example, Anderson, 1980, 1981, 1983). Since an in-depth review of all types of cognitive representational systems is beyond the scope of this paper, the focus will be on production systems. Although production systems have been used extensively in cognitive psychology only since 1970, they have a long history in mathematics and computer science. Further, according to Anderson (1980), the notion of production systems "... is the most extensively developed and adequate representation of human cognitive skills" (1980, p. 238).

Anderson's Production System Architecture

Anderson (1981, 1983) distinguishes between what we know about and what we know how to do. Examples of things we know about include the definitions of words, facts (such as "George Washington was the first President of the United States"), and rules (such as "i before e except after c"). All of the things we know about constitute declarative knowledge. Declarative knowledge need not be verbal. Although it often takes the form of abstract propositions, declarative knowledge can also take the form of temporal strings (such as our memory for the order of events--that is, which things came earlier and later in our lives) or the form of images (such as our memory for what a zebra looks like or the arrangement of our living room). Although the following "rule of thumb" is not always true, declarative knowledge can usually be expressed verbally or "declared." Thus, we typically are able to describe the contents of declarative knowledge.

The term "cognitive skill" is used by Anderson (1980) to refer to the ability to perform various intellectual procedures. Our ability to understand and generate language or apply our knowledge of rules to solve a problem would be examples of procedural knowledge. Anderson argues that as we use the same knowledge over and over again in a procedure, we can lose our access to the rules that originally produced or enabled the procedure, and thus lose our ability to verbally report or "declare" these rules. An example of the distinction between declarative and procedural knowledge in the context of second language acquisition is the following, from Anderson (1980):

When we learn a foreign language in a classroom situation, we are aware of the rules of the language, especially just after a lesson that spells them out. One might argue that our knowledge of the language at that time is declarative. We speak the learned language by using general rule-following procedures applied to the rules we have learned, rather than speaking directly, as we do in our native language. Not surprisingly, applying this knowledge is a much slower and more painful process than applying the procedurally encoded knowledge of our own language. Eventually, if we are lucky, we can come to know a foreign language as well as we know our native language. At that point, we often forget the rules of the foreign language. It is as if the class-taught declarative knowledge had been transformed into a procedural form. (p. 224)

An important question at this point is "How does one proceed from the rule-bound declarative stage of performance of a complex skill to the more automatic proceduralized stage?" Anderson (1980, 1983) described three stages of skill acquisition. A brief overview of this three-stage process is provided. Following this overview, a description of production systems as a way of representing the knowledge underlying cognitive skills is presented.

Stages of Skill Acquisition

For most learners, skill learning begins with an instructional or study phase. During this phase, the learner is either instructed about how to do the task or attempts to figure it out and study it himself. This stage involves conscious activity on the part of the learner, and the acquired knowledge at this stage is typically declarative and can be described verbally by the learner. For instance, one can memorize vocabulary and the rules for grammar when learning to speak a second language, just as one can memorize any other set of facts. This knowledge enables one to describe how to communicate in the second language, but the knowledge itself is inadequate for skilled performance.

There follows a second stage in skill acquisition which Anderson (1983) calls the compilation stage. During this phase, two main changes occur with respect to the development of proficiency of the skill. First, errors in the original declarative representation of the knowledge are gradually detected and eliminated. Second, the connections among the various elements or components of the skill are strengthened. Basically during this stage, the declarative knowledge is turned into its procedural form. However, the declarative representation initially formed is not always lost. Thus, even as we become more fluent at speaking a foreign language, we may still remember the rules of grammar. Performance at this stage begins to resemble expert performance, but may still be slower and errors may still occur.

During the third stage, the performance is "fine-tuned." The execution or performance of the skill becomes virtually automatic and errors that inhibit successful performance of the skill disappear. The skill can often be executed effortlessly, and there is much less demand on working memory or "consciousness" at this stage. Thus, as we become skilled drivers, we shift gears smoothly and automatically, without consciously applying rules. In fact, skilled drivers are typically able to drive and carry on a conversation

at the same time, indicating that very little conscious processing is being devoted to driving. The skill has become automatic and the driver is able to monitor its effective execution with very little effort. Similarly, as we become more proficient in a second language, we are able to comprehend and produce utterances with little difficulty. It is important to note that skilled performance improves gradually. While a fact can often be learned in one trial, a skill can only be mastered after a relatively long period of practice.

Anderson (1983) has analyzed the application of these three stages to a variety of skills including solving geometry problems, language translation, learning telephone numbers, and learning the rules of games. In subsequent work, Anderson (1985) added examples from performing mental addition, the acquisition of reading skills, and solving problems in physics. Thus, evidence from a number of complex skills supports the validity of these stages.

Production Systems

One of the problems in developing an effective and useful theory of cognitive skill acquisition has been understanding and explaining how complex cognitive skills are represented in human memory. Anderson (1983) argued for a unitary theory of the mind or a common cognitive system for all higher-level mental processes. This position is in direct contrast to the opinion of many theorists, including Chomsky (1980), who argued:

We may usefully think of the language faculty, the number faculty, and others as "mental organs," analogous to the heart or the visual system or the system of motor coordination and planning. There appears to be no clear demarcation line between physical organs, perceptual and motor systems, and cognitive faculties in the respects in question. In short, there seems little reason to insist that the brain is unique in the biological world, in that it is unstructured and undifferentiated, developing on the basis of uniform principles of growth or learning--say those of some learning theory, or of some yet-to-be conceived general-purpose learning strategy--that are common to all domains. (1980, p. 3)

Recently, however, artificial intelligence has made an important contribution to cognitive psychology by developing sets of procedural formalisms that serve as models of how complex cognitive skills can be represented in memory using uniform principles of representation. One such representational system, a production system, is briefly described here. (For more detailed information, see Anderson, 1980, 1983.) Anderson argues that all complex cognitive skills can be represented as production systems. Computer simulations of a number of cognitive skills, including such seemingly diverse skills as reading (Thibadeau, Just, & Carpenter, 1982) and playing chess (Newell & Simon, 1972) have been developed using production system architecture. In its most basic form, a production has a "condition" and an "action." The condition contains a clause or set of clauses preceded by IF, and the action has a clause or set of clauses preceded by THEN. Consider, for example, the following production for pluralization, from Anderson (1980);

IF the goal is to generate a plural of a noun and the noun ends in a hard consonant,

THEN generate the noun + s.

Note that one of the conditions for this production refers to an internal goal. This is an important point because as internal goals or states change for the learner, the IF clause will match different sets of stored conditions and the learner will execute different sets of actions. Condition-action pairs (or productions) such as this one can initially be represented in declarative form, and gradually, through practice, can be compiled into production sets and fine-tuned to the point of automatic execution. Such a representational system can be used to represent specific procedures in any domain (math, physics, chess, language, and so on) as well as general strategies or domain-independent problem solving procedures. Moreover, the relationships among elements of a skill can be clearly specified, and the conditions that must exist for a particular skill to operate can be made explicit (see Gagne, 1985, for a discussion of production system notation in the representation of basic skills).

In summary, viewing second language acquisition as a cognitive skill offers the following advantages: (a) it can provide a comprehensive and well-specified theoretical framework for second language learning, (b) it can be adapted to provide a detailed process view of second language acquisition, and (c) it can help to identify and test the existence and applicability of specific learning strategies that are appropriate at various stages in second language development. In the following section, several current models of second language acquisition will be described, and issues concerning the adequacy of those models will be discussed.

SECOND LANGUAGE ACQUISITION

Research in language acquisition encompasses a broad range of variables related to the teaching and/or learning process. Research efforts addressing language learning in the early sixties focused primarily on the teaching process and involved comparisons of different language teaching methodologies. The results of these efforts produced inconclusive results regarding the effectiveness of these methodologies. Stemming from these results as well as the behaviorist versus cognitivist debate, second language researchers shifted in focus from the teaching process to the learning process. This shift provided new definitions and directions for research concerning "second language acquisition" (Larsen-Freeman, 1980),.

The research and theory that marked this shift to the learning process have focused on identifying factors that promote the learning/acquisition of a second language. At a minimum the following factors are judged to be critical by second language researchers (Larsen-Freeman, 1985):

- The setting in which the learning/acquisition takes place (e.g., classroom, social setting, etc.),
- Learner variables (e.g., age, aptitude, motivation, cognitive style, etc.),

- The nature of the target language to be acquired and the native language of the learner, and the similarities/differences between them, and
- The reasons why the learning is being undertaken (to assimilate into a new cultural community, for travel, employment, enrichment, etc.).

Language learning theorists have attempted to take into account one or more of these factors in studying the nature of the language learning process. Language learning theories can be classified into three categories: biological/neurological, cognitive, and social-affective. As noted earlier, this paper addresses the linkages between learning strategy models, cognitive psychology, and second language learning/acquisition. Thus, a select subset of theories from the cognitive theories category will be discussed in the following section. Although some theories address more than one factor or characteristic within the above-mentioned categories, those with a major cognitive focus or component are included in the discussion.

Cognitive Theories (Chamot & Stewner-Manzanares, 1985)

Language acquisition theories in this category focus on the cognitive processes and abilities that the learner brings to the language learning task. Studies of second language learning and cognition have concentrated on innate characteristics of cognition, intelligence, developmental stages, cognitive styles, the interaction of cognition and the linguistic environment, and cognitive processes such as transfer.

Developmental theories hold that language learning is qualitatively different at different developmental stages. Studies suggest that, although cognitive development enhances the rate of second language learning, it does not explain the differences in eventual attainment of proficiency of adults and children. Krashen, Long, and Scarcella (1979), for example, suggest that if time and exposure are held constant, (a) adults proceed through the early stages of syntactical and morphological development faster than children, (b) older children acquire faster than younger children, and (c) learners with natural exposure to second languages during childhood generally achieve higher second language proficiency than those beginning second language acquisition as adults.

Drawing upon this research, Krashen (1981, 1982) developed what he referred to as the Monitor Theory. This theory emerged from a series of hypotheses formulated to explain second language acquisition in informal and formal learning environments. Krashen (1982) has suggested that two distinct processes are involved in second language acquisition. "Learning," in Krashen's view, is the result of conscious application of knowledge that a learner has about a language. Krashen suggests that "learning" is useful only insofar as it is applied as a conscious "monitor" during language production, as a learner tries to apply rules to correct speech or writing as it is taking place. "Acquisition," according to Krashen, refers to a subconscious process in which the learner develops ability in the language through comprehensible input. Krashen believes that the subconscious "acquisition" process accounts for the greatest part of a person's competence in a second language. Krashen's distinction between acquisition and learning has been criticized by

a number of theorists and researchers on the grounds that all second language learning, in common with other types of learning, proceeds from controlled processes to automatic ones (Chaudron, 1985; McLaughlin, Rossman, & McLeod, 1983; Spolsky, 1985).

Differences in cognitive style have been posited as an explanation for different language learning abilities in different settings. De Avila and Duncan (1979) indicate that variation in linguistic proficiency and not variation in cognitive abilities account for differences in academic achievement. Based on numerous studies, De Avila (1984) suggests that bilinguals have language, not cognitive, deficits and that the cognitive skills that students have should be further strengthened through instruction that includes activities of higher order cognitive demand. It is De Avila's belief that most classroom practice focuses on rote learning of facts and not on complex forms of information processing so that the cognitive advantages of bilingual students are seldom seen or exercised.

Differences in cognitive style have also been investigated by Ventriglia (1982), who identified three basic types of language learning styles in children learning a second language: beading, braiding, and orchestrating. These terms refer to children's preferences for initial processing of the new language semantically, syntactically, or phonologically. Far from claiming that one style is superior to another in terms of language acquisition, Ventriglia points out that teachers must take these differences into account when deciding what and how to teach second language learners.

Cummins' (1984) theory of interdependence is based on the observation that some bilingual children, in spite of high conversational proficiency, do not achieve academically. The interdependence theory holds that there are common underlying proficiencies which contribute to academic growth in the first and second languages. More importantly, Cummins believes that if academic skills and content knowledge are developed initially in the first language, they can be more readily transferred to the second language. Hence, he suggests that the emergence of academic skills in the second language depends on the skills established in the first language.

Cummins indicates that two dimensions can be used to describe the language demands encountered by limited English-proficient (LEP) students. The first dimension concerns contextual cues that assist comprehension, and the second concerns the complexity of the task. Language that is easiest to understand is contextualized and rich in nonverbal cues such as concrete objects, gestures, facial expressions, and visual aids. Language that is most difficult to understand is language in which context clues have been reduced to such a degree that comprehension depends entirely on the listener's or reader's ability to extract meaning from a text without assistance from nonverbal cues. Cummins' second dimension describes the language demands that relate to the task difficulty, and suggests that comprehension is affected by the complexity of the cognitive demands for performing the task. Language tasks can range from the demanding to the undemanding. Examples of relatively undemanding language tasks are vocabulary, grammar drills, and following directions. More demanding tasks call on integrative skills such as reading and listening comprehension, and speaking or writing about academic topics. Tasks are especially demanding when reasoning skills are required.

Following Cummins' (1984) model, tasks involving language use can be classified into one of four categories: (a) cognitively undemanding and embedded in a context that clarifies meaning; (b) little context provided, but cognitively simple; (c) cognitively demanding, but context is provided; and (d) the language has both reduced context and cognitive complexity.

Recognizing the disparity in tasks required inside and outside the classroom, Tikunoff (1984) proposed a model of Student Functional Proficiency. To Cummins' (1984) continua of skills required in and out of academic settings, Tikunoff adds three intersecting circles of interactional, academic, and participative competence. That is, the classroom requires a student to (a) observe classroom rules and social rules of discourse, (b) function at increasingly complex cognitive levels, and (c) be competent in the procedural rules of the class.

Some theorists hypothesize that language learning is closely related to intelligence, and that the general factor (the "g" factor) underlies all performance. Observing that language ability has also correlated highly with I.Q. measures, Oller (1979) hypothesizes that the same skills underlying intelligence also underlie first and second language learning. However, as Hatch (1983) points out, it is unlikely that one factor underlies all intelligence and all language since there are cues of language learning in the presence of learning disabilities.

McLaughlin, Rossman, and McLeod (1983) propose an information processing approach to second language learning. In this theory, the learner is viewed as an active organizer of incoming information with processing limitations and capabilities. While motivation is considered to be an important element in language learning, the learner's cognitive system is central to processing. Thus, the learner is able to store and retrieve information according to the degree to which the information was processed. Evidence for aspects of the information processing model comes from studies of language processing and memory. One implication of information processing for second language acquisition is that learners actively impose cognitive schemata on incoming data in an effort to organize that data. McLaughlin et al. (1983) proposed that the learner uses a top-down approach (or knowledge-governed system) which makes use of internal schemata, as well as a bottom-up approach (or an input-governed system) which processes external input to achieve automaticity. In both cases, cognition is involved and the cognitive involvement required is set by the task itself.

Krashen and Terrell (1983) propose a Natural Approach to second language learning based on Krashen's notion of comprehensible input which states that the second language is acquired as a result of receiving input that is just marginally above the student's current language competence. In the Natural Approach, initial activities focus on listening. Students are not required to speak until they are ready, and grammatical accuracy is not explicitly taught. Given sufficient comprehensible input, students are expected to correct their own errors as part of the "acquisition" process.

Fillmore and Swain's (1984) interactionist model considers general cognitive processes as a central component to determining the rate and ultimate success of second language learners. In addition, the model includes five other components: the linguistic component, the social component, the learner

component, the target language users component, and the social context component. The linguistic component refers to the assumptions that both the learner and the native speaker have regarding the target language. The social component includes what the learners know about the rules of interaction. The learner component includes factors of age, personality, aptitude, motivation, and cognitive style. The user component is made up of setting, social roles, and the status of the first and target languages. Finally, the social context component consists of the native speaker's language modifications for the non-native speaker, the nature of the target language, and the relation between the mother tongue and the target language. It is believed that all six components interact with each other in complex and as yet unknown ways.

Receptive Skills in Second Language Learning

In second language learning, receptive skills are identified as reading and listening, whereas speaking and writing are described as productive skills. Receptive skills require comprehension of language input, whether visual or oral. Unlike speaking and writing, reading and listening comprehension is not observable. Whether a listener or reader has really comprehended a message can only be ascertained by eliciting some kind of observable response after the actual interaction with the oral or written text. However, an after-the-fact comprehension task reveals only what the listener or reader is able to retrieve from memory, and this may represent only a portion of what was actually comprehended during the listening or reading process.

Current research in first language reading is applicable to second language reading insofar as the actual process is concerned (Phillips, 1984). Thus, reading as a "psycholinguistic guessing game" (Goodman, Goodman, & Flores, 1979) and as an interactive process between what the reader sees on the page and what is already in the reader's head (Smith, 1982) is as true for the second language reader as for the first language reader. However, second language readers have special comprehension barriers to overcome. With limited proficiency in the second language, they may not know the way the new language works well enough to make accurate guesses about meaning. In addition, prior knowledge may not relate directly to the cultural and linguistic assumptions present in the written text, and so may not be useful in assisting comprehension. Even if the prior knowledge is relevant to the text, this condition may not be immediately apparent to the reader who has acquired this knowledge originally in a language other than that of the text.

Another potential barrier to second language reading comprehension is lack of effective reading strategies developed in the first language. Students who view the reading process as a linear word by word decoding activity in their first language (often signalled by sub-vocalization, or moving the lips in silent pronunciation of each word) are not likely to use strategies in second language reading such as processing meaningful chunks rather than individual words, skipping over redundant items, predicting what is to follow, looking back to correct inaccurate predictions, using context to infer meanings of unfamiliar items, and using linguistic markers to identify features of discourse and text organization. Second language teachers reinforce students' ideas of reading as a word-by-word process when they call for extensive oral reading that focuses on correct pronunciation rather than on comprehension of meaning (Phillips, 1984).

Listening Comprehension Skills

Although reading is generally recognized as an essential skill in second language learning, most especially for students who must eventually read to learn in academic subjects taught in the second language, less attention has traditionally been paid to listening as an important language skill (Conrad, 1985; Meyer, 1984). As Gilman and Moody (1984) have pointed out, this may in large part be due to the fact that listening is generally not taught as a specific skill in the first language classroom, and that structured methodologies for teaching listening are not available. Of the four language skills, listening has been described as a covert activity (Joiner, 1984) because it has the least concrete manifestation. Speaking, though also involving oral language, seems to be more concrete because one can hear and see a person speaking, while reading and writing have text on paper as concrete representations of a process. Listening is a process that one assumes is taking place when a person appears to be attending to oral input; only the actual listener knows if listening is in fact happening.

Listening is important because of the amount of information that is acquired through this mode, particularly in school and training settings. Rivers (1981), for example, has calculated that adults spend close to half of their communication time in listening--far more than they spend on any of the other language skills.

Listening comprehension is considered central to second language acquisition and learning by a number of theorists, researchers, and methodologists. Research on the effects of delaying oral production while second language learners concentrate on the development of listening comprehension skills has shown that this approach is effective and that there is a higher degree of transfer of what is learned through the listening mode compared to what is learned through the other language skills (Asher, 1981, 1982; Gary, 1975; Gary & Gary, 1981; Postovsky, 1974; Winitz & Reeds, 1973). Methodologies focusing on a listening approach at the beginning level of second language study include Total Physical Response (Asher, 1982), the comprehension-based approaches described by Gary and Gary (1981) and by Winitz (1981), and the Natural Approach (Terrell, 1977).

Two major theoretical models of listening comprehension have been described in both the first and second language acquisition literature. In one, a bottom-up or phonological/grammatical process is postulated, and in the other, a top-down or semantic process is claimed (Byrnes, 1984). The bottom-up process is seen as highly analytic, as listeners focus on the sounds of individual words and the grammatical relationships of words in a sentence; the top-down processor takes a wholistic view of the language input and relates it to existing schema in order to comprehend the larger meaning. These two processes parallel different views on reading: some reading methodologists argue that children should begin to associate sounds with symbols (phonics) and then build the sounds into words and eventually into sentences, whereas others argue that children should initially make semantic associations of whole words with their meanings and then progress to making sense of entire chunks of text. The proficient reader is able to make use of both processes as needed, though as Smith (1982) points out, fluent reading is an interactive process between what the reader already knows and the meaning expressed in the text; a fluent reader has recourse to grammatical and word analysis skills only when

meaning breaks down, and the reader must go back to the point where a prediction was made to find out why the prediction did not materialize, which usually is because a word was misread or a grammatical marker went unheeded.

These two theoretical models may not, in fact, be in opposition, but may in reality describe the listening process at different levels of language proficiency. Native speakers of a language do not listen exclusively at one level; rather, they use both global and specific strategies to make sense of aural input (Haviland & Clark, 1974; Winitz et al., 1973). Second language learners, on the other hand, apparently have access to different types of comprehension processing depending on their degree of proficiency in the new language. The beginning second language learner cannot process in a top-down fashion because of an insufficient data base of the second language, and so is actually forced to use a bottom-up approach. The beginning second language learner, however, may show a preference for either using available cues to guess at meaning or rely on conscious grammatical knowledge to assist comprehension (Byrnes, 1984). Conrad (1985) found that listening comprehension strategies were similar to reading comprehension strategies for ESL students: less proficient students concentrated on deciphering syntactic information contained mostly at the sentence level, whereas more proficient students were able to process the message primarily on a semantic basis on the level of extended text. That is, beginning level students who are processing grammatical elements at the sentence level need to be taught strategies for comprehending the global meaning of an entire text, whereas more advanced students who can comprehend the main ideas of a text may need assistance in the precise interpretation of the fine details signalled by grammatical elements.

The teaching of listening comprehension has been subject to uncertainties about both method and content (Gilman & Moody, 1984). The development of proficiency guidelines developed by the American Council on the Teaching of Foreign Language (ACTFL) (1986) for listening comprehension as well as the other language skills have been extremely valuable because of describing the types of second language behaviors that characterize different levels of proficiency. The ACTFL guidelines for listening comprehension are shown in Table 1. These guidelines were developed to describe the types of foreign language proficiency levels attained by students in foreign language education programs in American schools and colleges. They are based on the proficiency guidelines originally developed by the Interagency Language Roundtable Testing Committee and represent a specification of language skills that can be expected from students enrolled in typical foreign language programs in the United States. Proficiency guidelines of this nature have not been developed for students of English as a second language; however, the general guidelines of what a student should be able to accomplish through the second language for the four language skills at different proficiency levels are useful units of measurement for all second language students.

For listening, the ACTFL Proficiency Guidelines describe the range of different kinds of oral comprehension tasks that learners accomplish from the beginning or novice level through intermediate and advanced levels. Beyond the advanced level is the superior level, which describes a listener who can understand all aspects of an oral text but may have some difficulties with rapid and highly colloquial or culturally referenced speech. The latest version of the ACTFL Proficiency Guidelines also provides an additional category for the receptive skills which is labelled as distinguished; this highly

Table 1

Generic Descriptions of Listening Proficiency
(American Council on the Teaching of Foreign Language (ACTFL))

These guidelines assume that all listening tasks take place in an authentic environment at a normal rate of speech using standard or near-standard norms.

Novice-Low	Understanding is limited to occasional isolated words, such as cognates, borrowed words, and high-frequency social conventions. Essentially no ability to comprehend even short utterances.
Novice-Mid	Able to understand some short, learned utterances, particularly where context strongly supports understanding and speech is clearly audible. Comprehends some words and phrases from simple questions, statements, high-frequency commands and courtesy formulae about topics that refer to basic personal information or the immediate physical setting. The listener requires long pauses for assimilation and periodically requests repetition and/or a slower rate of speech.
Novice-High	Able to understand short, learned utterances and some sentence-length utterances, particularly where context strongly supports understanding and speech is clearly audible. Comprehends words and phrases from simple questions, statements, high-frequency commands and courtesy formulae. May require repetition, rephrasing and/or a slowed rate of speech for comprehension.
Intermediate-Low	Able to understand sentence-length utterances which consist of recombinations of learned elements in a limited number of content areas, particularly if strongly supported by the situational context. Content refers to basic personal background and needs, social conventions and routine tasks, such as getting meals and receiving simple instructions and directions. Listening tasks pertain primarily to spontaneous face-to-face conversations. Understanding is often uneven; repetition and rewording may be necessary. Misunderstandings in both main ideas and details arise frequently.
Intermediate-Mid	Able to understand sentence-length utterances which consist of recombinations of learned utterances on a variety of topics. Content continues to refer primarily to basic personal background and needs, social conventions and somewhat more complex tasks, such as lodging, transportation, and shopping. Additional content areas include some personal interests and activities, and a greater diversity of instructions and directions. Listening tasks not only pertain to spontaneous face-to-face

Table 1 (Continued)

Intermediate-Mid (continued)	conversations but also to short routine telephone conversations and some deliberate speech, such as simple announcements and reports over the media. Understanding continues to be uneven.
Intermediate-High	Able to sustain understanding over longer stretches of connected discourse on a number of topics pertaining to different times and places; however, understanding is inconsistent due to failure to grasp main ideas and/or details. Thus, while topics do not differ significantly from those of an Advanced level listener, comprehension is less in quantity and poorer in quality.
Advanced	Able to understand main ideas and most details of connected discourse on a variety of topics beyond the immediacy of the situation. Comprehension may be uneven due to a variety of linguistic and extralinguistic factors, among which topic familiarity is very prominent. These texts frequently involve description and narration in different time frames or aspects, such as present, nonpast, habitual, or imperfective. Texts may include interviews, short lectures on familiar topics, and news items and reports primarily dealing with factual information. Listener is aware of cohesive devices but may not be able to use them to follow the sequence of thought in an oral text.
Advanced-Plus	Able to understand the main ideas of most speech in a standard dialect; however, the listener may not be able to sustain comprehension in extended discourse which is propositionally and linguistically complex. Listener shows an emerging awareness of culturally implied meanings beyond the surface meanings of the text but may fail to grasp sociocultural nuances of the message.
Superior	Able to understand the main ideas of all speech in a standard dialect, including technical discussion in a field of specialization. Can follow the essentials of extended discourse which is propositionally and linguistically complex, as in academic-professional settings, in lectures, speeches, and reports. Listener shows some appreciation of aesthetic norms of target language, of idioms, colloquialisms, and register shifting. Able to make inferences within the cultural framework of the target language. Understanding is aided by an awareness of the underlying organizational structure of the oral text and includes sensitivity for its social and cultural references and its affective overtones. Rarely misunderstands but may not understand excessively

Table 1 (Continued)

Superior (continued)	rapid, highly colloquial speech or speech that has strong cultural references.
Distinguished	Able to understand all forms and styles of speech pertinent to personal, social, and professional needs tailored to different audiences. Shows strong sensitivity to social and cultural references and aesthetic norms by processing language from within the cultural framework. Texts include theater plays, screen productions, editorials, symposia, academic debates, public policy statements, literary readings, and most jokes and puns. May have difficulty with some dialects and slang.

proficient level is included in order to account for the fact that generally the receptive skills are in advance of the productive skills, so that a learner at the superior level of speaking or writing may be classified at a higher (distinguished) level in the receptive skills of reading and listening.

Taxonomies of listening skills have been developed by various theorists and researchers. Richards (1983) has proposed two taxonomies, one for conversational and one for academic listening. These taxonomies describe the micro-skills needed for successful listening in each of these contexts. Rivers (1981) and Taylor (1981) have designed developmental taxonomies of listening skills which begin with the learner identifying isolated elements of a message, gradually comprehending larger units, and finally developing not only comprehension but also retention. Chamot (1977) also proposed a developmental listening skills model which goes beyond comprehension and retention to include higher level cognitive processes such as analysis, inference, and evaluation. A developmental taxonomy does not necessarily impose a lock-step linear progression of listening tasks in which students are expected to become proficient at one level before encountering tasks at the next level. Rather, listening activities at each of the developmental levels should be provided for students at all proficiency levels (Rivers, 1981).

Although the development of listening comprehension skills is given as an instructional objective in current second language courses and listening exercises appear in recent instructional materials, the process of listening and the strategies that affect this process positively are imperfectly understood (Byrnes, 1984; Gilman & Moody, 1984; Joiner, 1984). Investigation of the ways in which second language learners learn to listen and practice listening can provide more than theoretical knowledge about listening processes; this type of research also can provide direct applications to improve the teaching of listening comprehension to second language learners.

LEARNING STRATEGIES

As suggested in the discussion above, one view of second language learning indicates that learners are subject totally to the conditions of the task that is presented to them. Richards (1983), for example, indicates that in teaching listening we can manipulate two variables. The first of these is the listener's input, or the language that the learner hears. Input can be manipulated by controlling for complexity, topic, rate, etc. The second variable that can be controlled in Richards' scheme is the task, or what the learner is asked to do. For example, the task may vary depending on whether the learner is asked to report global comprehension (where the listener attempts to understand the overall meaning), or partial comprehension (where comprehension of only specific items is required).

The view that input governs comprehension in second language learning is also contained in Krashen's (1982) Input Hypothesis, which states that input that stimulates language acquisition must contain "some structures and vocabulary that are only slightly beyond the student's level" (Krashen, Terrell, Ehrman, & Herzog, 1984, p. 264). The principal influence on comprehension apart from the complexity or rate of the input is extralinguistic cues, where contextual supports may enhance the learner's comprehension. The learner may influence the process only minimally by concentrating on global comprehension

of main ideas rather than on supporting detail. Language proficiency, according to Krashen, is most effectively acquired in natural language contexts rather than through directed or conscious learning activities.

An alternative view of second language listening comprehension has emerged in which the listener plays a far more active role in learning and acts in an information processing capacity (e.g., Bialystok, 1979; Byrnes, 1984; Chaudron, 1985; McLaughlin, Rossman, & McLeod, 1983; O'Malley, Chamot, Stewner-Manzanares, Kupper, & Russo, 1985a). In this view, the focus is on intake, or how the learner perceives and interprets new information, rather than on input, or the characteristics of the information provided. The learner is viewed as forming hypotheses about rules of the target language and testing them out (Chaudron, 1985; Faerch & Kasper, 1980). In addition, learners use strategies that transfer information from short-term memory to long-term storage (McLaughlin et al., 1983), and that assist (in Krashen's terms) both learning and acquisition (Bialystok, 1979). Effective learners have been noted to deploy a wide repertoire of metacognitive, cognitive, and social/affective processing strategies (O'Malley et al., 1985a).

While considerable research has emerged on this view of learning with native English-speaking persons (e.g., Brown, Bransford, Ferrara, & Campione, 1983; Chipman, Segal, & Glaser, 1985; Gagne, 1985; Weinstein & Mayer, 1985), this research has tended to focus on strategies for encoding, or for getting information from short-term into long-term memory, and on retrieval, or for gaining access to information once stored in long-term memory. Strategies for language comprehension are also necessary for a complete understanding of second language acquisition. That is, second language learners need to develop strategies that will assist in understanding the message being communicated, as well as strategies that will assist the learner in acquiring and retrieving the information. Weinstein and Mayer (1985), for example, define cognitive strategies as exclusively relating to encoding processes, as does Gagne (1985). Weinstein & Mayer (1985) and Gagne (1985) also discuss various higher order (metacognitive) strategies such as strategies that assist the learner in selecting aspects of incoming information on which to focus, monitoring the comprehension of incoming information, or reviewing the success of a learning endeavor. Gagne also points out the importance of knowing the conditions under which a given strategy is likely to be effective. However, none of these authors describe strategies as assisting in comprehension, that is, in making the message comprehensible to a person learning a second language.

In this paper, learning strategies are defined as behaviors and thoughts engaged in by a learner that are intended to influence comprehension or retention (including both acquisition and retrieval). In the second language acquisition literature, two issues have led to confusion over the definition of learning strategies. First, learning strategies are often confused with communication strategies. Communication strategies focus principally on relating or understanding a message as contrasted with learning new information through the second language. Communication strategies such as paraphrasing, repeating, emphasizing, and gesturing can be employed in a first language as well as in a second language. The distinction between communication strategies and learning strategies is not always clear. A person can intend to communicate, to learn new information through the language, and to learn new elements or uses of the language itself all at the same time. Such multiple uses of language seem more likely to occur in second language acquisition than between

two native speakers. The second issue on which there has been confusion in the second language literature is that strategies are often discussed in the context of social communication (e.g., Wenden, 1985) rather than in the context of academic language tasks. This tends to obscure potential applications of strategies to classroom learning. In our own use of the term learning strategies, we focus on classroom learning while allowing for uses in non-classroom settings.

Learning strategies can be classified into three groupings based on the type of processing that takes place. The three types of processing are characterized by metacognitive strategies (higher order strategies that can be applied to a variety of tasks), cognitive strategies (strategies that operate directly on the incoming information), and social-affective strategies (strategies that involve interaction with another person or ideational control over affect). Definitions of strategies are presented in Table 2.

Inspection of Table 2 indicates that learners have a number of possible ways of influencing learning through strategy applications. Learners can exercise metacognitive strategies by selectively attending to special parts of the information as one might in listening for main ideas or for names and dates in a history lecture. Learners can also direct their attention in general to stay focused on the listening activity so their attention does not wander to irrelevant distractors. Another metacognitive strategy that learners can use is to monitor the input to determine if they understand sufficient amounts of the information to maintain overall comprehension. Most likely, it is this monitoring function that determines whether or not additional strategies are necessary to compensate for information that was not understood.

The classification scheme presented in Table 2 enables us to discuss strategies for listening comprehension directly. Further, strategies can be discussed that apply to relatively simple tasks, such as vocabulary learning, as contrasted with complex tasks, such as listening comprehension. Learners can assist comprehension for simple tasks such as learning vocabulary lists by using resourcing (looking up items in a dictionary or reference book) and/or direct translation (converting information from the target language into the native language). With more complex tasks, learners may assist comprehension by deduction (looking for rules governing language constructions) and looking for similarities between the first and second language. An example of looking for similarities between the two languages is in using cognates or looking for common meaning in prefixes or suffixes. Other strategies that are useful in assisting comprehension with more complex tasks are inferencing (making an educated guess at the meaning of a word or phrase by using context clues) and elaboration (making use of prior knowledge about the content of the spoken message to assist in comprehension or recall).

The learner can assist encoding or the transfer of information into long-term storage with simple tasks such as vocabulary or word lists by using a variety of strategies. These include repetition (going over the material again), grouping (collecting words that have common semantic features), imagery (developing a mental picture of the word and its meaning or the context in which learning occurred), and auditory representation (developing a mental picture of the sound of the word in order to retain the pronunciation). With more complicated tasks, such as listening to an academic lecture, the learner can assist the transfer of information into long-term memory by elaboration

Table 2

Learning Strategy Definitions

A. Metacognitive Strategies

- | | |
|----------------------------|---|
| 1. Advance Organization | Previewing the main ideas and concepts of the material to be learned, often by skimming the text for the organizing principle. |
| 2. Organizational Planning | Planning the parts, sequence, main ideas, or language functions to be expressed orally or in writing. |
| 3. Directed Attention | Deciding in advance to attend in general to a learning task and to ignore irrelevant distractors. |
| 4. Selective Attention | Deciding in advance to attend to specific aspects of input. |
| 5. Self-monitoring | Checking one's comprehension during listening or reading, or checking the accuracy and/or appropriateness of one's oral or written production while it is taking place. |
| 6. Self-evaluation | Judging how well one has accomplished a learning activity after it has been completed. |
| 7. Self-management | Understanding the conditions that help one learn and arranging for the presence of those conditions. |

B. Cognitive Strategies

- | | |
|-------------------------|--|
| 1. Repetition/Imitation | Imitating a language model exactly, including oral practice, silent practice, and copying. |
| 2. Rehearsal | Rehearsing the language needed, with attention to meaning, for an oral or written task. |
| 3. Resourcing | Using target language reference materials such as dictionaries, encyclopedias, or textbooks. |
| 4. Translation | Using the first language as a base for understanding and/or producing the second language. |
| 5. Grouping | Classifying words, terminology, or concepts according to their attributes. |
-

Table 2 (Continued)

B. Cognitive Strategies
(Continued)

- | | |
|-----------------------------|---|
| 6. Notetaking | Writing down key words and concepts in abbreviated verbal, graphic, or numerical form during a listening or reading activity. |
| 7. Summarizing | Making a mental or written summary of information gained through listening or reading. |
| 8. Deduction/Induction | Applying rules to understand or produce the second language, or making up rules based on language analysis. |
| 9. Imagery | Using visual images (either mental or actual) to understand and remember new information. |
| 10. Auditory Representation | Playing back in one's mind the sound of a word, phrase, or longer language sequence. |
| 11. Contextualization | Placing a word or phrase in a meaningful language sequence. |
| 12. Elaboration | Relating new information to what is already known. |
| 13. Transfer | Using previous linguistic knowledge to facilitate a new learning task. |
| 14. Inferencing | Using available information to guess meanings of new items, predict outcomes, or complete missing parts. |

C. Social Affective Strategies

- | | |
|----------------------------------|---|
| 1. Questioning for Clarification | Eliciting from a teacher or peer additional explanation, rephrasing, examples, or verification. |
| 2. Cooperation | Working together with peers to solve a problem, pool information, check a learning task, model a language activity, or get feedback on oral or written performance. |
| 3. Self-talk | Reducing anxiety by using mental techniques that make one feel competent to do the learning task. |

(as before, making use of prior knowledge) or notetaking. Weinstein and Mayer (1986) differentiate elaboration into three component processes: summarizing (paraphrasing from time to time to guarantee that the information is being retained as well as understood), constructing (forming internal connections between different aspects of the new information), and integrating (forming external connections between the new information and prior knowledge). In addition, the learner can assist the retention of more complicated tasks such as listening to a lecture by forms of outlining that require organization of the information (e.g., making a T-list in which the main ideas are recorded on the left of a page and the corresponding details are entered on the right). Another strategy for more complicated tasks is to form a hierarchy from the information in which portions of the narrative are sequenced and subsumed within other parts or linked pictorially (as in drawing networks).

The final set of strategies students may add to their capability for learning during both simple and complex listening tasks consists of social mediation and affective strategies. Two examples of social mediating strategies involve requesting cooperation from another person in the learning activity (e.g., sharing information on the main ideas or details of an oral narrative) or asking questions for clarification (e.g., an inquiry of a teacher or a peer requesting a definition or amplification of an idea). Affective strategies such as self-talk may be important if the student is so excessively concerned about understanding that calming self-directions are required to allay anxieties. This may occur for some students in particular content areas such as mathematics.

This characterization of learning strategies, while substantially tied to models of learning and cognition for reading comprehension such as those discussed by Mayer (1977, 1982), requires additional analysis before confident applications can be made to listening comprehension. Among the questions that need to be addressed are the validity of classifying strategies in terms of those which assist comprehension vs. those which assist retention, or those which are applicable to simple vs. complex tasks. Additionally, this characterization of learning strategies can be used in explaining issues in listening comprehension such as "chunking" or the size of the input message that a listener will assemble before attempting to store information in long-term memory. Thus far, there has been no attempt to suggest an analysis of this kind.

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